

Item Response Theory Modeling of the PTSD Checklist in OEF/OIF Veterans: Implications for Diagnosis

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Diagnostic criteria in *DSM-IV*

- Most symptom criteria in *DSM-IV* are polythetic—a certain minimal number are required, but none are necessary and sufficient to all diagnosed individuals
- Within PTSD clusters B, C, & D, symptoms are given equal weight towards the diagnostic threshold
- Gives rise to 1,750 unique minimal combinations (*DSM-5* will have more)

Not all symptoms created equal

- Across many *DSM* disorders, research generally finds that symptom criteria have unequal diagnostic validity
- Symptoms vary in the severity of pathology they index
- Some reflect greater association with the “core” pathology, and thus are more diagnostically useful

Current research questions

In a population sample of OEF/OIF Veterans exposed to deployment-related stressors...

1. What level of posttraumatic stress (PTS) pathology is indicated by the different PTSD symptom criteria?
2. Which symptoms are most strongly associated with the core PTS pathology (and which are more peripheral)?

Data characteristics

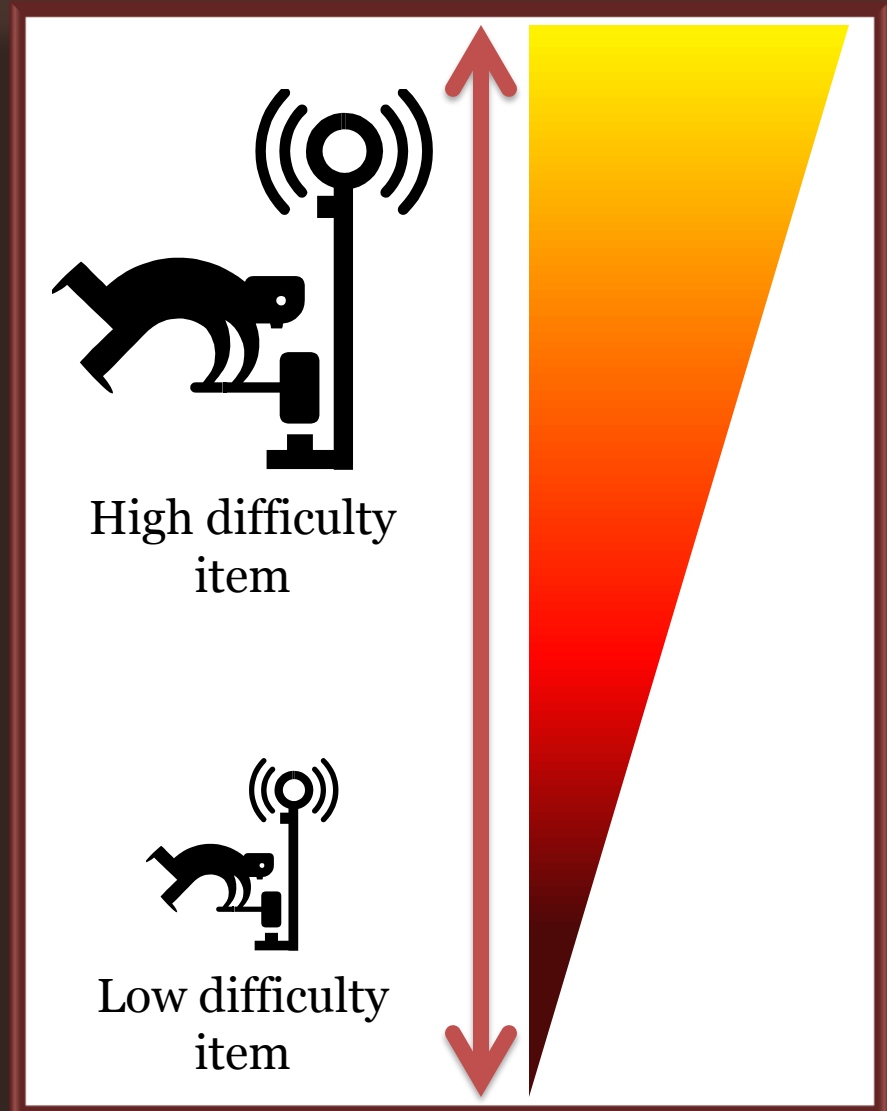
- PTSD Checklist (PCL) responses from 2,341 OEF/OIF Veterans (51% women)
- Part of confidential mail survey of deployment experiences and post-deployment adjustment
- High proportions of men and women reported combat experiences
- Women also reported a high rate of exposure to sexual harassment

Data characteristics

- PCL is the most widely used self-report inventory of the 17 *DSM-IV* PTSD symptom criteria
- Respondents rated how much they were bothered in the past month by reactions to “stressful deployment experiences”
- Each symptom rated from 1 (Not at all) to 5 (Extremely)
- Commonly, symptoms rated ≥ 3 are considered to be present

Item response theory (IRT)

- Links observable item responses to persons' standing on a latent dimension
- Items are located on the same dimension — item *difficulty* reflects the amount of trait needed for item endorsement to become probable

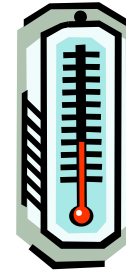


Symptom	IRT Difficulty	%
Memory lapses (C3)	1.36	18
Flashbacks (B3)	1.21	18
Foreshortened future (C7)	1.16	21
Physiological reactivity (B5)	1.05	21
Avoids places (C2)	1.03	22
Nightmares (B2)	0.97	23
Emotionally numb (C6)	0.84	27
Distressed by reminders (B4)	0.83	26
Avoids thoughts (C1)	0.78	29
Anhedonia (C4)	0.78	28
Intrusive thoughts (B1)	0.76	28
Exaggerated startle (D5)	0.74	30
Feelings of detachment (C5)	0.59	33
Hypervigilance (D4)	0.54	35
Difficulty concentrating (D3)	0.53	35
Irritability (D2)	0.40	38
Difficulty sleeping (D5)	0.35	41

- Experience-specific cognitive/affective perturbations, behavioral maladaptations reflect more severe PTS pathology
- Moderate variability among re-experiencing (B) and avoidance / numbing (C) symptoms

Item response theory (IRT)

- Items also vary in discrimination — sensitivity to differences between persons' trait levels
- Reflects how strongly the latent trait influences the responses to the item



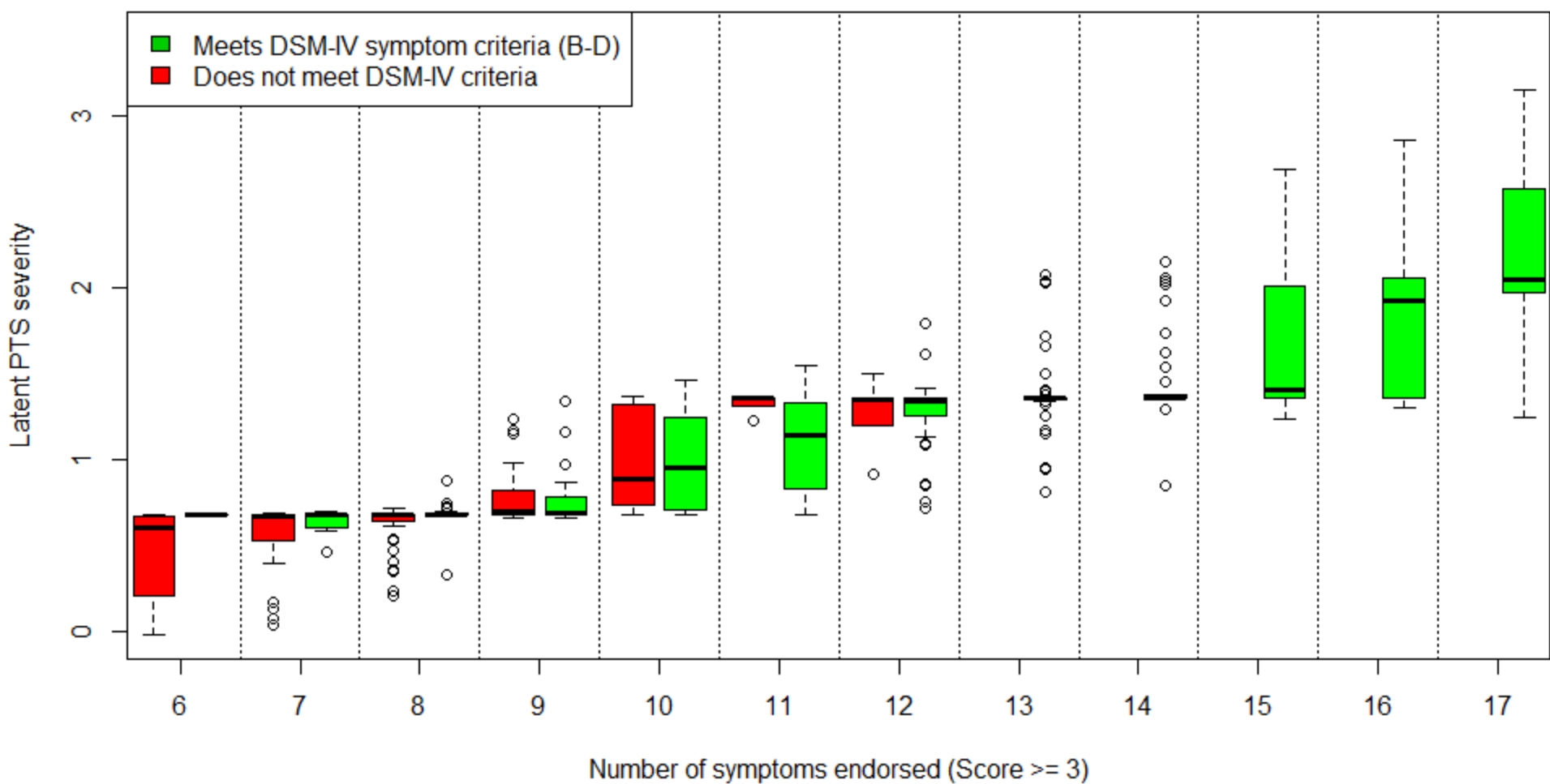
High
discrimination



Low
discrimination

Symptom	Discrimination
Flashbacks (B3)	3.17
Distressed by reminders (B4)	3.06
Physiological reactivity (B5)	3.01
Avoids places (C2)	3.00
Intrusive thoughts (B1)	2.88
Nightmares (B2)	2.75
Exaggerated startle (D5)	2.65
Irritability (D2)	2.54
Feelings of detachment (C5)	2.54
Difficulty concentrating (D3)	2.52
Avoids thoughts (C1)	2.48
Anhedonia (C4)	2.42
Hypervigilance (D4)	2.38
Emotionally numb (C6)	2.19
Foreshortened future (C7)	2.07
Difficulty sleeping (D5)	1.96
Memory lapses (C3)	1.83

- All symptoms in the range of good discrimination
- Re-experiencing and behavioral avoidance appear to be the “core” of PTS pathology
- Symptoms of generalized dysphoria may be less specific to PTS



- Marked variability in latent severity among cases meeting *DSM-IV* criteria with same number of symptoms
- Similar PTS severity observed in cases not meeting criteria
- Majority of the latter met B and D but not C criteria

Implications

- “Number of symptoms” is a suboptimal metric for PTS severity
 - For many, fewer symptoms represented more severe PTS than in cases with more symptoms
- Problematic that Criterion C represented a barrier to (presumptive) diagnosis, as most C symptoms were less central to PTS
- Some symptoms (e.g., foreshortened future, memory lapses) were uncommon and more weakly associated with “core” PTS, suggesting limited diagnostic validity

Implications

- *DSM* diagnoses like PTSD emphasize inter-rater reliability at the expense of construct validity
- *DSM-5* will better reflect the structure of PTSD but will reinforce the dominance of polythetic diagnostic criteria
- Where possible, future PTSD assessments should de-emphasize symptom counting and favor more valid severity metrics

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